

Appln No. 10/722,204

Preliminary Amdt date December 29, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-16 (Canceled)

17. (New) A method of coupling a laser diode to an optical fiber comprising:

placing the laser diode on a substrate;

depositing a polymer layer on at least a part of the substrate between the laser diode and the optical fiber;

locating a light emitting area of the laser diode; and

forming a waveguide on the polymer layer between the light emitting area of the laser diode and the optical fiber.

18. (New) The method of claim 17, further comprising depositing a cladding layer of light-curable optical polymer on the substrate, wherein the laser diode is placed on the cladding layer.

19. (New) The method of claim 18, wherein depositing the polymer layer comprises depositing the polymer layer on the cladding layer and the laser diode.

20. (New) The method of claim 17, wherein the polymer layer is light sensitive, and wherein forming the waveguide comprises writing a waveguide region on the polymer layer,

developing the polymer layer with a solvent, and removing unexposed regions of the polymer layer.

21. (New) The method of claim 20, further comprising encapsulating the waveguide with a low-index cladding polymer layer.

22. (New) The method of claim 20, wherein writing the waveguide region comprises writing the waveguide region using a collimated light beam.

23. (New) The method of claim 17, further comprising encapsulating the waveguide with a low-index cladding polymer.

24. (New) The method of claim 17, wherein the optical fiber is coupled to a plurality of waveguide branches, and forming the waveguide comprises forming the waveguide between the light emitting area of the laser diode and one of the waveguide branches.

25. (New) The method of claim 17, wherein placing the laser diode comprises etching the polymer layer to form a trench, and placing the laser diode in the trench.

26. (New) The method of claim 17, wherein the polymer layer comprises a nonlinear optically active polymer, and writing the waveguide comprises writing the waveguide using a laser beam so as to align dipole molecules of the polymer using

an electric field of the laser beam, thereby causing a change in a local refractive index of the polymer.

27. (New) The method of claim 17, further comprising depositing a buffer layer of low-index passive polymer on the substrate prior to depositing the polymer layer.

28. (New) The method of claim 17, further comprising depositing a low-index cladding layer over the polymer layer.

29. (New) The method of claim 17, wherein the optical fiber is coupled to a plurality of waveguide branches, placing the laser diode comprises placing a plurality of laser diodes on the substrate, and forming the waveguide comprises forming a plurality of waveguides, each said waveguide being formed between one of the laser diodes and a corresponding one of the waveguide branches.

30. (New) The method of claim 29, wherein the plurality of laser diodes comprises an array of laser diodes having predetermined spacings therebetween, wherein locating the light emitting area comprises locating the light emitting area of one of the laser diodes in the array.

31. (New) A method of coupling a laser diode to an optical fiber comprising:

- placing a cladding layer on a substrate;
- placing the laser diode on the cladding layer;

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depositing a polymer layer on the laser diode and the cladding layer;

locating a light emitting area of the laser diode; and

forming a waveguide on the polymer layer between the light emitting area of the laser diode and the optical fiber.

32. (New) A method of coupling a laser diode to an optical fiber comprising:

depositing a buffer layer on a substrate;

depositing a polymer layer on the buffer layer;

depositing a cladding layer on the polymer layer;

etching a trench into the layers to a depth such that the laser diode placed in the trench would be aligned with a plane of the polymer layer;

placing the laser diode in the trench;

locating a light emitting area of the laser diode; and

forming a waveguide on the polymer layer between the light emitting area of the laser diode and the optical fiber.